

WHAT IS CLAIMED IS:

1. A gray scale display method for providing memories that respectively store each bit of gray scale data which indicates gray shade and that cause pixels arranged in a matrix in the row direction and in the column direction to produce a gray scale display, said gray scale display method comprising the steps of:
  - dividing one field into subfields corresponding to bits of said gray scale data;
  - setting a period of each subfield in such a manner as to correspond to a weight of each of said bits;
  - in one subfield and with respect to one pixel,
  - reading, from said memory, bits corresponding to the subfield within the gray scale data corresponding to the pixel;
  - latching the bits;
  - producing at least one of an ON display and an OFF display according to the bits; and
  - writing the latched bits to the read memory again.
2. An electro-optical device which has pixels arranged in a matrix in a row direction and in a column direction, which divides one field into subfields corresponding to bits of gray scale data, which sets a period of each subfield in such a manner as to correspond to a weight of each of said bits, and which causes each of said pixels to produce at least one of an ON display and an OFF display according to the corresponding bits within said gray scale data, said electro-optical device comprising for each of said pixels:
  - memories that store each bit of said gray scale data;
  - a selector that selects a memory that stores bits corresponding to a subfield from among said memories;
  - a latch circuit that reads and latches bits stored in the memory selected by said selector, and that rewrites in the memory selected by said selector;
  - an on/off selection switch that selects a voltage corresponding to an ON display or an OFF display in accordance with the bit read from the memory selected by said selector; and
  - a pixel electrode to which the voltage selected by said on/off selection switch is applied.
3. The electro-optical device according to Claim 2, said memory including:
  - a first transfer switch that transfers the bits of said gray scale data when a writing control signal indicating a bit writing timing switches to an active level; and

a holding element that holds a voltage corresponding to the bits transferred by said transfer switch.

4. The electro-optical device according to Claim 2, further comprising a rewriting prohibition switch that prohibits rewriting to a memory until said latch circuit reads the bits stored in the memory selected by said selector and latches the bits.

5. The electro-optical device according to Claim 2, further comprising a second transfer switch that transfers a writing permission signal which permits rewriting when a writing control signal indicating a bit writing timing switches to an active level,

said memory writing the bits of said gray scale data only when the writing permission signal transferred by said second transfer switch is at an active level.

6. The electro-optical device according to Claim 2, the selection by said on/off selection switch being performed simultaneously in all the pixels in each subfield.

7. The electro-optical device according to Claim 2, the selection by said on/off selection switch being performed sequentially for each row in each subfield.

8. The electro-optical device according to Claim 2, said selector including switching elements which are interposed between each of said memories and said latch circuit and which are turned on in accordance with a subfield selection signal in which only one of the switching elements exclusively switches to an active level for each subfield.

9. The electro-optical device according to Claim 2, said selector including a plurality of switching elements which cause only one of paths within the paths between each of said memories and said latch circuit to be exclusively turned on in accordance with data which specifies the subfield.

10. The electro-optical device according to Claim 2, further comprising an opposing electrode which opposes said pixel electrode via an electro-optical material, a voltage corresponding to said OFF display being made to be substantially the same as the applied voltage of said opposing electrode,

a voltage corresponding to said ON display being inverted with respect to the voltage corresponding to said OFF display and is supplied for one or more fields.

11. The electro-optical device according to Claim 2, further comprising an opposing electrode which opposes said pixel electrode via an electro-optical material,

a voltage corresponding to said OFF display being made to be substantially the same as the applied voltage of said opposing electrode,

said on/off selection switch alternately selecting, for one or more fields, a positive-polarity-side voltage and a negative-polarity-side voltage, in which the voltage

differences with respect to the voltage corresponding to said OFF display are nearly equal, in accordance with a polarity signal indicating a writing polarity when the voltage corresponding to said ON display is selected.

12. An electronic apparatus, comprising:  
the electro-optical device according to claim 2.